Listing of the Claims:

The following is a complete listing of all the claims in the application, with an indication of the status of each:

Claims 1-14 (Canceled).

Claim 15 (Currently Amended) A magneto-resistance effect element comprising:

a lower conductive layer;

a fixed layer provided on the lower conductive layer and having a pinned orientation of magnetization;

a first non-magnetic layer provided on the fixed layer;

a free layer provided on the first non-magnetic layer and having an orientation of magnetization varied by a magnetic field applied thereto;

a first magnetic layer provided on the free layer and magnetically coupled to the free layer;

a second magnetic layer provided on the first magnetic layer and magnetically coupled to the first magnetic layer;

a third non-magnetic layer between said first magnetic layer and said second magnetic layer; and

a vertical bias layer for applying a magnetic field to said first and second magnetic layers, and a sense current for detecting a change in electrical resistance of said first non-magnetic layer flows substantially in perpendicular relation to said first non-magnetic layer.

Claim16 (Original). The magneto-resistance effect element according to claim 15, wherein said first magnetic layer is equal to or greater than said free layer in length in the direction of the magnetic field applied by said vertical bias layer.

Claim 17 (Original). The magneto-resistance effect element according to claim 15, wherein said second magnetic layer is equal to or greater than said free layer in length in the direction of the magnetic field applied by said vertical bias layer.

Claim 18 (Original). The magneto-resistance effect element according to claim 15, further comprising a fixing layer, disposed between said lower conductive layer and said fixed layer, for pinning the orientation of magnetization of said fixed layer.

Claim 19 (Original). The magneto-resistance effect element according to claim 15, further comprising a second non-magnetic layer between said free layer and said first magnetic layer.

Claim 20 (Canceled).

Claim 21 (Original). The magneto-resistance effect element according to claim 15, wherein said free layer is magnetically coupled to said first magnetic layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 22 (Original). The magneto-resistance effect element according to claim 15, wherein said first magnetic layer is magnetically coupled to said second magnetic layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 23 (Original). The magneto-resistance effect element according to claim 15, wherein the product of saturation magnetization and film thickness of said first magnetic layer is substantially equal to the product of saturation magnetization and film thickness of said second magnetic layer.

Claim 24 (Currently Amended). The magneto-resistance effect element according to claim ~~20~~ 15, wherein a three-layered film made up of said first magnetic layer, said third non-magnetic layer, and said second magnetic layer is a layered antiferromagnetic body.

Claim 25 (Withdrawn). The magneto-resistance effect element according to claim 15, wherein at least part of said first magnetic layer is in direct contact with said vertical bias layer.

Claim 26 (Original). The magneto-resistance effect element according to claim 15, wherein at least part of said second magnetic layer is in direct contact with said vertical bias layer.

Claim 27 (Withdrawn). A magneto-resistance effect element comprising:

a lower conductive layer;

a fixed layer provided on the lower conductive layer and having a pinned orientation of magnetization;

a non-magnetic layer provided on the fixed layer;

a free layer provided on the non-magnetic layer and having an orientation of magnetization varied by a magnetic field applied thereto;

a magnetic layer provided on the free layer; and

a vertical bias layer, provided on the magnetic layer, for applying a magnetic field to said magnetic layer, and a sense current for detecting a change in electrical resistance of said non-magnetic layer flows substantially in perpendicular relation to said non-magnetic layer.

Claim 28 (Withdrawn). The magneto-resistance effect element according to claim 27, further comprising a second magnetic layer between said magnetic layer and said vertical bias layer.

Claim 29 (Withdrawn). A magneto-resistance effect element comprising:

a lower conductive layer;

a first fixed layer provided on the lower conductive layer and having a pinned orientation of magnetization;

a first non-magnetic layer provided on the first fixed layer;

a first free layer provided on the first non-magnetic layer and having an orientation of magnetization varied by a magnetic field applied thereto;

a magnetic layer provided on the first free layer and magnetically coupled to the first free layer;

a second free layer provided on the magnetic layer and magnetically coupled to the magnetic layer;

a second non-magnetic layer provided on the second free layer;

a second fixed layer provided on the second non-magnetic layer and having a pinned orientation of magnetization; and

a vertical bias layer for applying a magnetic field to said magnetic layer, and a sense current for detecting a change in electrical resistance of said first and second non-magnetic layers flows substantially in perpendicular relation to said first and second non-magnetic layers.

Claim 30 (Withdrawn). The magneto-resistance effect element according to claim 29, wherein said magnetic layer is equal to or greater than said first and second free layers in length in the direction of the magnetic field applied by said vertical bias layer.

Claim 31 (Withdrawn). The magneto-resistance effect element according to claim 29, further comprising a first fixing layer, disposed below said first fixed layer, for pinning the orientation of magnetization of said first fixed layer.

Claim 32 (Withdrawn). The magneto-resistance effect element according to claim 29, further comprising a second fixing layer, disposed above said second fixed layer, for pinning the orientation of magnetization of said second fixed layer.

Claim 33 (Withdrawn). The magneto-resistance effect element according to claim 29, wherein said first free layer is magnetically coupled to said magnetic layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 34 (Withdrawn). The magneto-resistance effect element according to claim 29, wherein said magnetic layer is magnetically coupled to said second free layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 35 (Withdrawn). The magneto-resistance effect element according to claim 29, wherein at least part of said magnetic layer is in direct contact with said vertical bias layer.

Claim 36 (Withdrawn). A magneto-resistance effect element comprising:

a lower conductive layer;

a first magnetic layer provided on the lower electrically conductive;

a second magnetic layer provided on the first magnetic layer and magnetically coupled to the first magnetic layer;

a free layer provided on the second magnetic layer, magnetically coupled to the second magnetic layer, and having an orientation of magnetization varied by a magnetic field applied thereto;

a first non-magnetic layer provided on the free layer;

a fixed layer provided on the first non-magnetic layer and having a pinned orientation of magnetization; and

a vertical bias layer for applying a magnetic field to said first

magnetic layer, and a sense current for detecting a change in electrical resistance of said first non-magnetic layer flows substantially in perpendicular relation to said first non-magnetic layer.

Claim 37 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein said first magnetic layer is equal to or greater than said free layer in length in the direction of the magnetic field applied by said vertical bias layer.

Claim 38 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein said second magnetic layer is equal to or greater than said free layer in length in the direction of the magnetic field applied by said vertical bias layer.

Claim 39 (Withdrawn). The magneto-resistance effect element according to claim 36, further comprising a fixing layer, disposed on said fixed layer, for pinning the orientation of magnetization of said fixed layer.

Claim 40 (Withdrawn). The magneto-resistance effect element according to claim 36, further comprising a second non-magnetic layer between said first magnetic layer and said second magnetic layer.

Claim 41 (Withdrawn). The magneto-resistance effect element according to claim 36, further comprising a third non-magnetic layer between said second magnetic layer and said free layer.

Claim 42 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein said free layer is magnetically coupled to said second magnetic layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 43 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein said first magnetic layer is magnetically coupled to said second magnetic layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 44 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein the product of saturation magnetization and film thickness of said first magnetic layer is substantially equal to the product of saturation magnetization and film thickness of said second magnetic layer.

Claim 45 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein a three-layered film made up of said first magnetic layer, said second non-magnetic layer, and said second magnetic layer is a layered antiferromagnetic body.

Claim 46 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein at least part of said first magnetic layer is in direct contact with said vertical bias layer.

Claim 47 (Withdrawn). The magneto-resistance effect element according to claim 36, wherein at least part of said second magnetic layer is in direct contact with said vertical bias layer.

Claim 48 (withdrawn). A magneto-resistance effect element comprising:

a lower conductive layer;

a vertical bias layer provided on the lower conductive layer;

a first magnetic layer provided on the vertical bias layer;

a second magnetic layer provided on the first magnetic layer and magnetically coupled to the first magnetic layer;

a free layer provided on the second magnetic layer, magnetically coupled to the second magnetic layer, and having an orientation of magnetization varied by a magnetic field applied thereto;

a first non-magnetic layer provided on the free layer; and

a fixed layer provided on the first non-magnetic layer and having a pinned orientation of magnetization, and a sense current for detecting a change in electrical resistance of said first non-magnetic layer flows substantially in perpendicular relation to said first non-magnetic layer.

Claim 49 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein said first magnetic layer is equal to or greater than said free layer in length in the direction of the magnetic field applied by said vertical bias layer.

Claim 50 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein said second magnetic layer is equal to or greater than said free layer in length in the direction of the magnetic field applied by said vertical bias layer.

Claim 51 (Withdrawn). The magneto-resistance effect element according to claim 48, further comprising a second non-magnetic layer between said first magnetic layer and said second magnetic layer.

Claim 52 (Withdrawn). The magneto-resistance effect element according to claim 48, further comprising a third non-magnetic layer between said second magnetic layer and said free layer.

Claim 53 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein said free layer is magnetically coupled to said second magnetic layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 54 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein said first magnetic layer is magnetically coupled to said second magnetic layer by anti-ferromagnetic coupling or ferromagnetic coupling.

Claim 55 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein the product of saturation magnetization and film thickness of said first magnetic layer is substantially equal to the product of saturation magnetization and film thickness of said second magnetic layer.

Claim 56 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein a three-layered film made up of said first magnetic layer, said second non-magnetic layer, and said second magnetic layer is a layered antiferromagnetic body.

Claim 57 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein at least part of said first magnetic layer is in direct contact with said vertical bias layer.

Claim 58 (Withdrawn). The magneto-resistance effect element according to claim 48, wherein at least part of said second magnetic layer is in direct contact with said vertical bias layer.

Claim 59 (Withdrawn). A magneto-resistance effect head comprising:

said magneto-resistance effect element including

a lower conductive layer, a free layer provided on the lower conductive layer and having an orientation of magnetization varied by a magnetic field applied thereto, anon-magnetic layer provided on top of the free layer, a fixed layer provided on the non-magnetic layer and having a pinned

orientation of magnetization, and a vertical bias layer, provided on said lower conductive layer, for applying a magnetic field to said free layer, and said free layer is greater in length in the direction of a magnetic field applied thereto by said vertical bias layer than said fixed layer, and a sense current for detecting a change in electrical resistance of said non-magnetic layer flows substantially in perpendicular relation to said non-magnetic layer;

a lower shield layer serving as a substrate for said magneto-resistance effect element;

an upper conductive layer, provided on said magneto-resistance effect element, for inputting a sense current for detecting a change in electrical resistance of said magneto-resistance effect element into said magneto-resistance effect element; and

an upper shield layer provided on the upper conductive layer.

Claim 60 (Withdrawn). The magneto-resistance effect head according to claim 59, wherein the lower conductive layer of said magneto-resistance effect element is integrated with said lower shield layer.

Claim 61 (Withdrawn). The magneto-resistance effect head according to claim 59, wherein said upper conductive layer is integrated with said upper shield layer.

Claim 62 (Withdrawn). A magneto-resistance transducer system comprising:

said magneto-resistance effect head according to claim 59;

an electric current generator circuit for supplying a sense current to said magneto-resistance effect head; and

a data read circuit for detecting a change in electrical resistance of said magneto-resistance effect head to determine a magnetic field applied to said magneto-resistance effect head.

Claim 63 (Withdrawn). A magnetic storage system comprising:

said magneto-resistance transducer system according to claim 62;

a magnetic storage medium having a plurality of tracks for allowing said magneto-resistance transducer system to write and read data thereon;

a first actuator for moving said magneto-resistance transducer system to where a selected track is located in said magnetic storage medium; and

a second actuator for rotatably driving said track.